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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,610	09/30/2003	Hiroshi Minami	SNY-042	2560

20374 7590 11/17/2005
KUBOVCIK & KUBOVCIK
SUITE 710
900 17TH STREET NW
WASHINGTON, DC 20006

EXAMINER

WEINER, LAURA S

ART UNIT PAPER NUMBER

1745

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/673,610

Applicant(s)

MINAMI ET AL.

Examiner

Laura S. Weiner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9-03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 17 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 17 and 19 are rejected because the claims are directed to manufacturing a battery but a battery is not produced. The methods steps produce an electrode having cracks where a solid electrolyte fills in the cracks. It is also unclear what happens to the "temporary-battery" prepared in the methods. The method should instead be "the method of forming cracks in an electrode" not the method of making a battery.

Double Patenting

2. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

3. Claim 18 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 1. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is

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proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5, 7-8, 16, 18 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Okada (JP 10-247520, translation).

Okada teaches [0014], a high polymer electrolyte is provided in a hole of the surface of an electrode. Okada teaches in [0019], that the negative electrode paste comprising graphite, PVDF and NMP was applied to a copper foil. Okada teaches in [0022], that EC and DEC are mixed with LiPF₄ and the added electrolytic solution was added and the porosity PVDF with which the negative electrode is equipped was made to swell with the electrolytic solution and was used as the porous polyelectrolyte.

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Okada teaches in [0033], that although the copolymer of a polyacrylonitrile, a polyvinyl chloride and vinylidene fluoride and hexafluoropropylene was used besides this although PVDF was used as a giant molecule of an organic polyelectrolyte but PVDF itself can be used. Okada teaches in [0034], that although PVDF is used as a giant molecule of an organic polyelectrolyte in the example, polyethers can also be used.

In the event any differences can be shown for the product of the product by process claims 1, 8 and 15, as opposed to the product taught by Okada, such differences would have been obvious to one of ordinary skill in the art as a routine modification of the product in the absence of a showing of unexpected results. *In re Thrope* 227 USPQ 964; (Fed. Cir. 1985).

With respect to the product by process claims 1, 8 and 15, the determination of patentability is based upon the product itself not upon the method of its production. *In re Thrope* 227 USPQ 964; *In re Brown* 173 USPQ 685; *In re Bridgeford* 149 USPQ 55; *In re Wertheim* 191 USPQ 90. Any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the Examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to the Applicants to establish that their product is patentably distinct. *In re Brown* 173 USPQ 685 and *In re Fessmann* 180 USPQ 324.

7. Claims 1-16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al. (US 2005/0244711) in combination with Okada (JP 10-247520, translation).

Fukui et al. teaches in [0050-0051], in Experiment 1, a negative electrode comprising silicon powder having a mean particle size of 3 μm , NMP solution and a polyamic acid binder (binder 1). The anode mix slurry was coated on one surface (rough surface) of an electrolytic copper foil having a surface roughness Ra of 0.5 μm . Fukui et al. teaches in [0077], that in like Experiment 1, the anode mix slurry was prepared by mixing silicon powder, NMP but a thermoplastic polyimide binder (binder 2) was used. Fukui et al. teaches in [0097-0099], Experiment 8, a negative electrode comprising silicon powder (particle diameter of 3 μm), NMP and a thermoplastic polyimide binder. An electrolytic copper foil having a roughness Ra of 0.5 μm was subjected to a heat treatment under argon atmosphere at 400 degrees C for 10 hours to provide the current collector. The anode mix slurry was coated on one surface (rough surface) of the current collector. Fukui et al. teaches in [0119-0120], in Comparative Example, a negative electrode comprising natural graphite, NMP and binder. Fukui et al. teaches in [0122-0123], that one can clearly see that when natural graphite is used as the negative electrode active material, cycle life differences arising from differences in mechanical properties of the binders are little appreciated. This is believed due to the volume expansion coefficient of natural graphite as it stores lithium, which is much lower than that of silicon. Thus, the negative electrode is improved by using silicon as the active material (instead of graphite) plus a binder because it restrains an active material layer from flaking off from current collector during charge and discharge and thus improves charge-discharge cycle performance characteristics of the rechargeable lithium battery.

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Okada teaches [0014], a high polymer electrolyte is provided in a hole of the surface of an electrode. Okada teaches in [0019], that the negative electrode paste comprising graphite, PVDF and NMP was applied to a copper foil. Okada teaches in [0022], that EC and DEC are mixed with LiPF₄ and the added electrolytic solution was added and the porosity PVDF with which the negative electrode is equipped was made to swell with the electrolytic solution and was used as the porous polyelectrolyte. Okada teaches in the abstract that this would enhance safety by maintaining battery performance by providing a porous high polymer electrolyte in the electrode and holding the electrolyte.

Okada teaches the claimed invention except does not teach that the anode comprises an active material comprising silicon and a binder comprising polyimide.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an anode comprising silicon powder and a polyimide binder taught by Fukui et al. in place of the graphite active material taught by Okada because Fukui et al. teaches that when natural graphite is used as the negative electrode active material, cycle life differences arising from differences in mechanical properties of the binders are little appreciated because of the volume expansion coefficient of natural graphite as it stores lithium, which is much lower than that of silicon.

Fukui et al. discloses the claimed invention except for specifically teaching that the anode material is a "composite electrode" in which cracks are formed in the anode layer and then the cracks are filled with the nonaqueous electrolyte in the form of a solid electrolyte.

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to form a "composite electrode" by making holes in the electrode as taught by Okada using the negative electrode taught by Fukui et al. because Okada teaches that this would enhance safety by maintaining battery performance by providing a porous high polymer electrolyte in the electrode and holding the electrolyte.

In the event any differences can be shown for the product of the product by process claim 1, as opposed to the product taught by Okada, such differences would have been obvious to one of ordinary skill in the art as a routine modification of the product in the absence of a showing of unexpected results. *In re Thrope* 227 USPQ 964; (*Fed. Cir.* 1985).

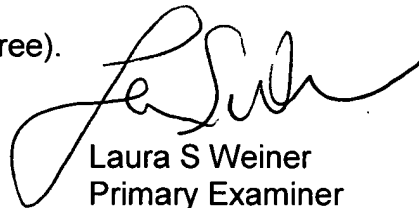
With respect to the product by process claim 1, the determination of patentability is based upon the product itself not upon the method of its production. *In re Thrope* 227 USPQ 964; *In re Brown* 173 USPQ 685; *In re Bridgeford* 149 USPQ 55; *In re Wertheim* 191 USPQ 90. Any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the Examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to the Applicants to establish that their product is patentably distinct. *In re Brown* 173 USPQ 685 and *In re Fessmann* 180 USPQ 324.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura S. Weiner whose telephone number is 571-272-1294. The examiner can normally be reached on M-F (6:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Laura S Weiner
Primary Examiner
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November 14, 2005